PLOTTING SIMPLE QUADRATIC GRAPHS

Answer all of these questions. Remember to show your working out in all questions.

MAIN QUESTIONS

1. $y = x^2$
2. $y = x^2 + 2$
3. $y = x^2 - 3$
4. $y = x^2 + 5$
5. $y = x^2 - 1$
6. $y = x^2 + 4x$
7. $y = x^2 - 2x$
8. $y = x^2 + 6x$
9. $y = x^2 - 4x$
10. $y = x^2 + 8x$
11. $y = x^2 + 3x$
12. $y = x^2 - 5x$
13. $y = x^2 + 7x$
14. $y = x^2 - 6x$
15. $y = x^2 + 9x$
16. $y = x^2 + 10x$
17. $y = x^2 - 7x$
18. $y = x^2 + 11x$
19. $y = x^2 - 8x$
20. $y = x^2 + 12x$
21. $y = x^2 - 9x$
22. $y = x^2 + 13x$
23. $y = x^2 - 10x$
24. $y = x^2 + 14x$
25. $y = x^2 - 11x$
26. $y = x^2 + 15x$
27. $y = x^2 - 12x$
28. $y = x^2 + 16x$

29. $y = x^2 - 13x$

30. $y = x^2 + 17x$

MASTER QUESTIONS

M1. A ball is thrown upwards and its height h in metres after t seconds is given by $h = -t^2 + 6t$. Find the maximum height reached by the ball.

M2. The area of a square is given by $A = x^2$, where x is the length of a side. If the area is 64 cm^2, find the length of a side.

M3. A parabola has the equation $y = x^2 - 4x + 3$. Find the coordinates of its vertex.

M4. The profit P in pounds from selling x items is given by $P = -x^2 + 10x$. Find the number of items that must be sold to maximise profit.

M5. A garden is in the shape of a rectangle with one side against a wall. The area is given by $A = -x^2 + 10x$, where x is the length of the side perpendicular to the wall. Find the maximum possible area.

M6. The height h in metres of a rocket t seconds after launch is given by $h = -5t^2 + 50t$. Find the time when the rocket reaches its maximum height.

M7. A quadratic graph has its vertex at (3, -4) and passes through the point (1, 0). Find its equation in the form $y = x^2 + bx + c$.

M8. The cost C in pounds of producing x items is given by $C = x^2 - 20x + 200$. Find the number of items that minimises the cost.

M9. A bridge's arch is modelled by the equation $y = -x^2 + 9$, where y is the height in metres and x is the horizontal distance in metres from the centre. Find the maximum height of the arch.

M10. A farmer has 100 metres of fencing to enclose a rectangular area. If one side is x metres, show that the area A is given by $A = -x^2 + 50x$. Find the maximum area that can be enclosed.